

COMPUTERWORLD

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Navy Has 30-Min Test For Any USASI Cobol Compiler

WASHINGTON, D.C. - A test for Cobol compilers that only takes a half hour to check out language and object program was released by The U.S. Navy this week.

The test is one of a package of eight aids devised to assist Naval EDP management in handling various standard language problems. Other aids, that are only partially ready, include a standard Cobol manual that can be used for all standard compilers; a Cobol translator that converts older Cobol programs to the new standard; and a Cobol program analyzer that

analyzes a program and indicates how sophisticated a computer will be needed to run it. These, as well as a Fortran package, are designed to be a prototype of aids that users need for language standardization.

Special Naval Team

The packages have been produced by a team headed by Norman Ream, a special assistant to the Secretary of the Navy. Ream - who has worked with IBM, Lockheed, and served as director of the National Bureau of Standards Computing Laboratory - told COMPUTERWORLD this week that: "We could not have done it without the help of the manufacturers. We only had four people working on this project, and they started only last August. The team has been working with all the manufacturers and they have received excellent cooperation."

Importance of Project

Asked what was particularly important about this project, Ream said: "With these methods a proper processing manager can avoid many of the pitfalls. He can now test out the compilers, and he will soon be able to use a standard manual which allows his programs to remain compatible from machine to machine. This is one of the most important points."

"In the future, he will be able to inspect his present Cobol programs, and see what type of Cobol compiler is needed to run it on a more recent system. The new breakdown of the standard-Cobol compiler into four levels allow him to find out which one he needs to do his job - and not to have to overbuy."

Asked if he was surprised by manufacturer cooperation, Ream commented: "No. Naturally we were very pleased, but they do have a great deal to gain from this. Very expensive benchmarks, for instance, can be done away with now. The manufacturer knows what tests will be applied and the Navy will be very happy to accept the results. In fact," he continued, "We can be proceeding with the programming now well ahead of actual procurement! This means that the manufacturer's equipment can be brought in and put to use almost immediately, thus avoiding some of the unfortunate facts of present day situations where we cannot really start programming until after we have decided on the machine concerned."

A Wonderful Set of Lads

Commander Grace Hopper, presently recalled to the Navy from Univac, also stressed the cooperation they had received from manufacturers, but pointed out the importance of the team who actually did the work. "Really a wonderful set of lads," she said. "They have come far in a few months." For technical details of the test see page 5.

IBM 1450, With 600 cpm Lundy, Coming For Banks

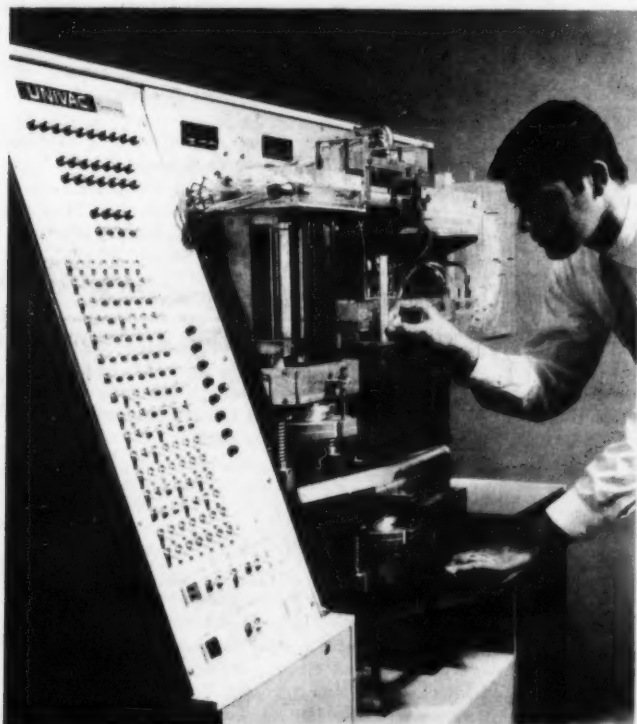
WHITE PLAINS, N.Y. - IBM has introduced a cut price, reconditioned 1440 system for bank data processing, and is calling it the 1450. The central processor rental cost has been cut substantially to approximately two-thirds of the original, and a Lundy 600 check per minute magnetic character reader has been added.

The same standard and application programs which ran on the 1440 are available - although the system has been slowed down through design changes. First deliveries of the system are scheduled for the fourth quarter this year.

IBM's spokesman said there was nothing to prevent a banker presently using a 1440 from replacing it with a cheaper 1450 if the volumes are appropriate. "The 1440 is designed to serve larger volumes, and the 1450 handles less volume. It has a slower reader, only up to 600 items per minute. Whether or not a bank would want to replace their 1440 with a 1450 is a question of volume - the amount of work to be done." The Lundy sorter reader that can be used on-line or off-line is the main peripheral. The system can have 8K, 12K, or 16K, and can use between two and five 1311 disk storage drives.

Used systems in the banking industry seem to be catching on. Burroughs Corp. announced a 340 System last September. This system was a modified B300 that used tapes, a 12 per minute sorter reader, and magnetic tape clusters instead of disks used by the IBM 1450. Deliveries of the system have been met with considerable success in the banks.

Its Got A Univac Tag . . .



Is Univac building a paint mixer? Or perhaps it's a soda bottler, or a coffee dispenser, or a card stacker. Turn to page 5 to find out what it is.

PL/1, Fortran

360 Link-Edit Times Halved For Compile-&Go Operations At TUCC

RALEIGH, N.C. - A loader that substitutes for the 360 linkage editor is in use here at three different 360 installations. It is speeding up turn arounds by quite a bit. It is also producing clearer printouts. The LDR loader is under the sponsorship of American Data Processing Inc. of Raleigh, N.C.

LDR is particularly suitable for compile and go jobs, and in tests using standard Triangle University Computation Center timing it has more than halved the total job time.

The basic technique used in LDR is to reduce the searching needed to find the program. Jim Burr, who produced the LDR, points out that a typical PL/1 program some 30 pages have to be searched for an

Configuration	Savings/Job
300/40 with 2311s	45 sec
360/40 with 2314s	35 sec
360/75 with extended core	4.5 secs For. 3.5 secs PL/1

area some 70 tracks long. "I have reduced the number of searches to about three or four," he told COMPUTERWORLD.

The effect of this technique varies depending on the 360 configurations used. In the three installations now using the system all are different and show a range of improvements that span much of the 360 family. (See box above.)

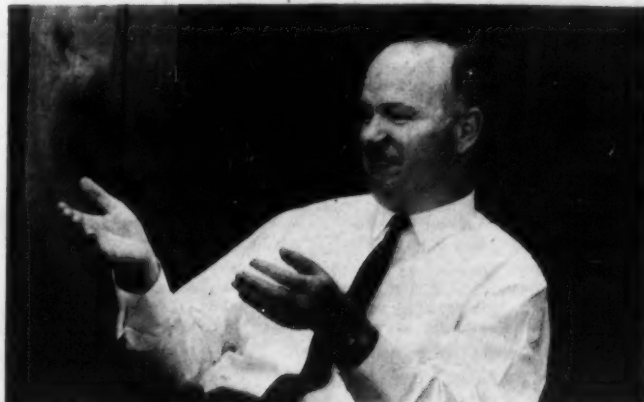
IC-4000 Offers Faster Fortrans

SANTA ANA, CAL. - An \$8000 - 12,000 per month scientific system that can emulate the IBM 7090s and the 1130s using microprogramming during program compilations for higher efficiency compilers has been announced for August delivery by Standard Computer Corp. The name: IC-4000. It is expected to reduce job turn around time by increasing the compilation and the execution speeds of scientific programs.

The essential difference between the IC-4000 and other commercial digital computers is inclusion of a small, fast computer within the computer which allows the system to execute dual level programs and interpret a variety of machine languages without degrading the performance of the main memory. This feature permits the user to easily change from one machine language to another.

This facilitates the mixing of machine language routines with micro-programmed routines in separate control memories. Utilizing this dual level programming approach Standard produced a high efficiency Fortran compiler.

Fred J. Howden Jr., Standard's president said, "We feel we have de-



Richard T. Hughes, a member of the board of directors of Standard Computer Corp., seems to be pleased with his new IC-4000.

signed a machine so high on performance and low in price, it will completely reshape current industry price/performance standards."

The IC-4000 will offer several complete languages, including Fortran IV and Cobol. As optional features the same system will emulate IBM's 7040/44, 7090/94 and 1130 computer systems. Even though it is designed specifically for scientists, engineers,

and specialized departments of large companies, use of Cobol will permit the system to work on solution of business oriented problems at the users discretion.

Standard will offer several versions of the IC-4000 ranging in price from \$276,900 to \$465,100. Comparable lease/rental contracts will range from \$7685 to \$12,385 per month.

Editorials

The Cobol Test

With the appearance this week of the Navy cobol test an era has ended. The era of tests and standards that could be understood only by full time specialists, and that could not be tested effectively, has been a sad one in the computer field. It takes more than a piece of paper to define a standard. It takes economic tests that are easily available.

It is interesting to note that this particular test is economic in its use of computer time, and was also economic in the number of dollars that it took to create. The Naval team was small and formed just last August. True, they had - and we are very glad that they had - cooperation from most of the leading manufacturers in the country. Even so, the fact remains that the test was produced economically and that it can be used economically.

The only thing wrong with this story is that it took eight years to arrive.

Management Opportunities

It is always exciting to find an opportunity for cutting your budget. Naturally, every time a salesman opens his mouth he claims that his particular product "won't cost anything, it will save you money." His claim is often true, but the down payment he asks for the moneysaving product can be a major stumbling block.

Often there is no place in the budget for such expenditures. No matter how great the potential savings, there is no existing procedure for making the necessary payments.

We in EDP need a new budget entry. We need a budget flexible enough to allow for the purchase of products that haven't been invented yet. The number of software systems for sale has skyrocketed. A year ago about one new package a week was announced. Today four or five packages are announced each week. And, in contrast to last year's specialized packages, the new programs have a wide range of usefulness.

Today's EDP manager cannot afford a rigid budget. He must use all his imagination and foresight to take advantage of the new software that will reduce programming and operating costs. It may not be here today, but chances are very good that it will be here next week.

COMPUTERWORLD

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User Responsibilities In Those Computer Contracts

By Alan Taylor

Naturally, there are many reasons why - after contract agreements have been signed - computer users feel that they are the losers. Two reasons are outstanding. One is the old "my grandfather did it this way and I don't see why I should change" feeling which has so aggravated computer management when other departments of the corporation have said it to them. The second reason is the failure of standard corporate defenses.

Computers have always been contracted for in one way; therefore, why change? The venerable tradition now dates back 2 generations - 10, 12, or even 20 years ago - but it is not realized that, at the time when these traditions were set up, computers were experiments. The firms did not greatly rely on them; they profited from them if the experiment succeeded, and a few of them did. But, primarily it was an expenditure of research money that affected no one.

Not Right for This Generation

It is hard to conceive of any reason why these research practices are being continued in this day and age when not merely is the computer essential for the firm, but is often being used to represent the good name of the firm right to its ultimate market (the consumer, the dealer, or whatever the case may be). It is true that last generation's computers - and the generation before that - were bought in this way. However, that is no reason for us to believe that it is proper to buy this generation's computers in the same way.

Corporate Defenses Failing

The second problem is why the standard defenses have failed. In one of his books, Prof Parkinson comments on the standard board meeting where a nuclear power station is passed without a dissenting vote, even though the technical director thinks it is inadvisable. By contrast, the problem of how much to pay for the coffee to be served at the trade union meetings gets an extensive workout!

The fact is that computers are now so fundamental to us that the decision to purchase them is taken without regard to legal or accounting problems involved in their success, or the problems involved in their failure. When the purchase reaches the accounting and legal areas it has already received the chairman's approval. New departments are already forming to implement it. The firm is waiting for the operation to be put into effect as soon as possible.

Management Responsibility Check List

- 1) Check the proposal carefully, and read the letter of transmittal as well as the proposal.
- 2) Watch for any item transferring responsibility to you such as: Expressions of gratitude to your staff for helping; statements regarding the need for undefinable items like "sound management policies."
- 3) Watch for any items that remove responsibility from the vendor such as: The use of "Timing Estimates" in the cover sheet of a timing document.
- 4) Watch for the relationship, or lack of it, between the agreement to be signed and the proposal. Often these are quite different.
- 5) Bring the attorneys in early.
- 6) See that management realizes the problems that face you, the EDP Manager, as a result of contractual agreements, and gives you the budget for them. If necessary, make do with a smaller computer and spend the balance to safeguard your firm's (as well as your own) future.

Under these circumstances, the most they can do is to see that they do not get worse terms than the fellow next door.

This is not the appropriate way to use defenses. A defense should be as strong as any potential offense. Here, the potential offense is, in truth, the whole operation of the firm. The defense (and that means the standing of the legal and accounting departments) should be appropriately upgraded.

Are You an EDP Manager?

It is not easy to be an EDP manager. The responsibilities are high and are getting higher. If you are in that position, one of the points that you should be working on is to see that people realize this fundamental fact - and budget your operation accordingly.

Letters to the Editor

Lawyers and Computers

To the Editor:

In response to your request of March 13 for further details on the two cases I mentioned in my earlier letter, I feel that your readers would be well advised to ask their own lawyers for analysis. For the assistance of these attorneys, the citations are *Sperry Rand Corp. v. The Industrial Supply Corp.* 377 F.2d 363, and *United States v. Wegematic Corp.* 360 F.2d 674.

The application of the law to a particular set of facts is, like systems analysis, a very specialized job, particularly in an area where the money involved is rarely less than five figures and usually at least seven. Any person contemplating a contract to acquire a computer system should be sure to bring his lawyer into the picture, preferably at an early enough stage so that he may take full advantage of the lawyer's thinking.

Robert P. Bigelow
Boston, Mass.

Thanks for the information, and I hope people note the point "preferably at an early enough

stage." I don't know when you think this is - but it should be well before any decisions are made. Ed.

Saving \$ With 360/25

To the Editor:

I am a recent subscriber to your publication, and found the article on the 360/25 - Parts 2 and 3 to be very informative.

Would it be possible to obtain Part 1?

Thank you.

Bruce H. Reinhold
Asst Vice President and Manager,
Systems and Programming
Pittsburgh National Bank
Pittsburgh, Penna.

We will be publishing a reprinted, and updated, version as a small pamphlet in April. In the meantime, we are sending you a copy of the issue with Part 1 in it. Ed.

A Good Word

To the Editor:

I find your newsweekly COMPUTERWORLD more interesting with every issue.

May I wish you continued success

and offer my appreciation for receiving this excellent publication.

Russel Zeller, Manager
Data Processing-Utility Office
City of Hamilton, Ohio

Memorex Disk Packs

To the Editor:

I received copies of your March 6 issue and was alarmed to note an article on page 3, which claimed Memorex disc packs were being sold through a distributor. This is *not* true.

Memorex sells its computer products through its own sales engineers, located in 25 offices in the United States.

We do manufacture disc packs for Kee Lox to their specifications under private label. This is quite a different situation.

Jerome M. Kelly
Manager, Advertising/Promotion
Memorex Corp.
Santa Clara, Calif.

COMPUTERWORLD did not realize that Memorex was making two types of disk packs. We had not realized that the day of the "private label" disk pack for manufacturing specifications had arrived. Things move so quickly! We will be on guard in the future. Ed.

Govt. Asks FCC To Bar Phone Firms From EDP

WASHINGTON, D.C. — Shall computer communication be regulated by the Federal Communications Commission? Shall telephone and telegraph companies be prohibited from selling electronic data processing services?

Recently the FCC heard from 55 parties who have ideas on these questions. Common carriers, computer manufacturers, users, service bureaus, and trade organizations expressed various and often conflicting views in legal briefs submitted to the commission. Each group argued for its own interests.

The common carriers opposed major restrictions on their activities in the EDP field. Univac and IBM opposed government intervention in principle. Small manufacturers argued that common carriers should be prohibited from selling EDP services. An inquiry into the "interdependence" of computers and communication has just been started by the FCC, with a final decision on whether to federally regulate this burgeoning "interdependent" field expected by mid November.

U.S. Justice Department Views

The U.S. Justice Department brief argued in support of a contention made in IBM's brief, that computer communication should be free from restrictive controls. Smaller organizations in the data processing field, as well as the Executive Agencies of the U.S. (EAUS), also took this view. In fact, the Justice Department urged the FCC to eliminate existing restrictions on use of equipment not owned by common carriers, on use of leased circuits, and on connections between public and private communication facilities. According to the EAUS brief, national regulation of computer communication would be unsound.

The Justice Department went further and agreed with smaller manufacturers on the point that common carriers should be prohibited from selling data processing services. Antitrust laws may require the government to control the amount of remote access data processing that common carriers can lawfully offer, the department said. The FCC should set interface standards for connections between common carrier lines and EDP equipment, EAUS added. It was on the subject of common carrier activity that the larger manufacturers opposed recommendations made in the EAUS and Justice briefs.

AT&T Urges FCC Control

American Telephone and Telegraph (AT & T) said the FCC ought to regulate all communication services sold by time sharing organizations. "The FCC could change the whole concept of our business...for the good as well as the bad," an AT & T spokesman said. "Telephone company transmission service between computers is subject to regulation. We believe that the communications act we currently have [the Federal Communications Act of 1934] adequately covers the computer area." The integrity of the U.S. communication network would suffer if other than Bell System equipment were to be attached, AT & T said, in what was virtually a claim to monopoly supply.

Telephone and telegraph companies ought to provide greater variety of transmission speeds for users, according to the Association of Data Processing Organizations (Adapso). They said common carriers should be required to restructure their rates, and that they should be prohibited from marketing electronic information services. Adapso speaks for the service bureaus.

Computer communication is largely a state and local issue, Business Equipment Manufacturers Association (Bema) contended. The Federal Communications Commission should not prohibit users from connecting their EDP equipment to telephone lines, Bema said in a 500 page document endorsed by most EDP businesses — because "a free environment best serves the public interest." Freedom from federal regulation is supported as a general principle by nearly the entire EDP industry.

Sale Of EDP Services

Bema said common carriers should be allowed to sell

EDP services only if 1) there be no adverse effect on essential telephone and telegraph services, and 2) there be no restraint of free competition in the supply of EDP services. Common carrier tariffs presently prohibit attachment of "foreign devices" to common carrier lines.

IBM Denies U.S. Authority

IBM said Washington has no authority to meddle in the data processing field, and that users should be free to attach data terminals or computer equipment that conform to standards specified by carriers. "A procedure should be established under which each common carrier would specify the technical standards for attached equipment," IBM said. "Data equipment certified by its manufacturer as in compliance with these prescribed standards could be attached to common carrier lines, subject to review by the [Federal Communication] Commission of any complaints which could not be resolved by the participants."

"This procedure should not be burdensome to the carriers or the Commission. Its implementation would further enhance full, vigorous, and effective competition in the provision of data processing services, and in the provision of a wide variety of data terminals which will be needed. This would in turn develop additional uses of communications, resulting in new business opportunities for carriers."

If common carriers seek to sell data processing services, IBM said, such common carriers should be treated just the same as anybody else. "Data processing services should be subject only to competition in the marketplace."

No Intrastate FCC Controls

Shared computers, when used to provide communication services, "are subject to regulation under the [Federal Communication] Act and the supplier of the shared computer is subject to regulation," according to a brief by Western Union Telegraph Co. A broader view was taken in the Western Union International brief, which said computers may be regulated by the FCC to the extent that they are used in "interstate and foreign communications." National authority to regulate computer communication is based on the commerce clause of the Federal Constitution, according to Western Union International.

IBM's answer is that none of the "traditional reasons" for regulation are applicable to the EDP field. "Indeed, data processing is an example of free and intense competition. To impose regulations on the industry would inevitably impede that competition," IBM contends.

"Data processing or information services involving computers and communication facilities, are not and should not be subject to regulation," Univac said in its brief. "The computer (or data processing) industry should evolve in a free competitive environment guaranteed by antitrust laws," Control Data said, adding, "The common carrier's offerings should be limited to providing communication channels."

FCC Not Equal To Demands

Some observers here are known to feel that the FCC lacks the physical capacity to regulate this nation's computer communications. On a modest \$19 million budget, the seven man commission has to meet major responsibilities. It assigns channels to the nation's TV stations, assigns frequencies to the nation's radio systems, and regularly reviews the licenses of them all. Extra special tasks take in everything from development of cable TV in small towns to research in advanced applications of extraterrestrial communication modes. These tasks are "unmanageable" on the FCC's present budget, Time magazine recently reported (March 8). It is not known whether the current FCC chairman, veteran civil servant Rosel Hyde, is of a mind to take on the additional task of grappling with the growing interdependence between computers and communication.

CSC Forms Institute 25% Faster Learning, On-Going Training Featured By New School

LOS ANGELES — Computer Sciences Corporation (CSC) has formed a new organization known as Computer Sciences Institute. The Institute will serve industry, government, the military, and the public education markets through the development of complete education systems and by providing managerial, professional, and technical training in the information sciences. The Institute will also undertake contract research for these markets.

Computer Sciences Institute claims to be the first organization to provide management education within fast changing environments. Courses will be taught in special facilities which must have advanced electronic and graphics equipment. The first two of these facilities are under construction at the Institute's headquarters in metropolitan Los Angeles and in New York.

Norman Carter, the vice president in charge, told COMPUTERWORLD that there are two important points. One, that students should and would respond to questions from their seats using push buttons. These responses will be displayed to the instructor, who will then call down the repeat of the material that had just been used, but in another form. He would do this if he felt the class was having some difficulty. This ability, combined with advanced audio/visual and other accelerated learning techniques would give the Institute better control of the learning situation.

The second point is follow up. "Management is beginning to realize that it has to keep its technical people up to date, and that this is going to cost money." He estimates that some



Norman H. Carter, vice president and general manager of Computer Sciences Institute.

firms will soon be prepared to give half an hour a day "upkeep" time so that technicians can keep up to date. His job, and the job of the Institute, is to provide the necessary material so that the time is well spent.

This, combined with some more advanced, but still comparatively normal displays, forms the background of what the Institute is calling "structured learning." This has been in operation at the University of Southern California for some time now, and observers believe that the rate of learning is up by approximately 25%. No formal tests, however, have been undertaken.

computer time report

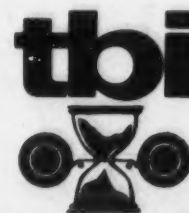
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NATIONAL BROKERS OF COMPUTER TIME

Johnson Makes ASCII Standard

WASHINGTON, D.C. — Acting by authority of a law that was originally proposed by Congressman Jack Brooks of Texas, President Lyndon B. Johnson has sent a memorandum to heads of all executive departments and agencies requiring adoption of ASCII. Computers bought after July 1, 1969, must have ASCII capability, the President said.

Optimum Efficiency

The standard will make it possible for the government to achieve "optimum efficiency and economy," ac-

cording to Brooks. It will enable business and government to act together with a view to solving "common problems" affecting computer users, he predicted.

Developed By Bema

The presidential memorandum said ASCII will be used "as the basic code in those networks of the National Communication System whose primary function is either the transmission of record information or the transmission of data related to data processing." The code was developed

under a standards program sponsored by the Business Equipment Manufacturers Association (Bema).

Long Delays

Comments have been passed in the community about the long lag between adoption of the ASCII standard some years ago and its coming into operation. It is not clear how the present memorandum will change the situation as many computers already have ASCII capability — and the problem appears to lie in the software rather than the hardware area.

Should Languages Come Before The Computer Design

SAN FRANCISCO — Should we design computers to fit languages? Will there be an Algol 68? Both these questions will be discussed during the afternoon session of the seventh annual Technical Symposium of the Bay Area Chapter of ACM on April 19th at the Jack Tar Hotel in San Francisco.

Answers To Questions

Prof William McKeeman of Stanford University will handle the first question and Prof John Peck of The University, Calgary, Alberta will discuss the second.

Covering The Grey Area

McKeeman has five patents pending on his designs related mainly to the Burroughs B6500 machine. He has worked on Algol interpreters, PL/I translators and machine simulators. He is eminently qualified to handle expertly that grey area of computer science which is conveniently labelled "Software-Hardware interaction." It is most important for "The Effective Use of High Level Languages" — which is the theme of the Symposium — that there should be more experts such as McKeeman who are at home with hardware and software.

For more information write to: Registration Chairman San Francisco Bay Area ACM Technical Symp. P.O. Box 2447, Menlo Park, Calif. 94025.

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Basic Patent Challenged

Is Eniac Patent A Fraud? Honeywell Tells Court It Is

Several years ago, before the days of computers, there was the Eniac which came to be known as the first computer. Linked to the names of its co-inventors, Eckert and Mauchly, it was the beginning of an era. The names are still linked, but there is a mystery surrounding these beginnings. There is a patent on Eniac, that was assigned to Univac. The patent appears to cover every possible computer in the country — and yet there is no sign of Eckert, Mauchly, or Univac getting rich on it. The question is: "Why not?"

Well, one reason is that some people think the patent was obtained by fraud. One company, Honeywell, has gone so far as to sue Univac rather than negotiate a settlement (that was never more than \$20,000,000). Just why they have this opinion about the patent is clearly set forth in the Court Complaint that follows. (Of course, Univac's lawyers disagree with practically everything in it.)

Here is the story as told by extracts from the Honeywell brief. They will give you an opportunity to find out why people are still talking about events dating back to 1945.

4. In 1942 John P. Eckert, Jr., and John W. Mauchly (hereinafter called "ECKERT & MAUCHLY"), then in the employ of the University of Pennsylvania, had described the advantages to be expected from an electronic high-speed computing machine of a digital type, which they stated could be built using then-known components and technology. Thereafter, such description of ECKERT & MAUCHLY was brought to the attention of the United States Government (hereinafter called "UNITED STATES"). As a result, on June 5, 1943, a contract was entered into between the UNITED STATES and the trustees of the University of Pennsylvania, No. W-670-ORD-4926, which, among other things and as supplemented, provided for the development, and when developed, the use by and delivery to the UNITED STATES, of such an electronic high-speed computer therein known and thereafter described as an electronic numerical integrator and computer (hereinafter called "ENIAC"). Pursuant to said Contract No. W-670-ORD-4926 as supplemented, and in performance thereof, ECKERT & MAUCHLY, among others, reduced their description of ENIAC to practice so that on or before December 10, 1945, there was made or caused to be made an actual "ENIAC MACHINE".

5. On June 19, 1947, ECKERT & MAUCHLY executed a non-exclusive, royalty-free license to the UNITED STATES under any inventions made or reduced to practice in the performance of said Contract No. W-670-ORD-4926 as supplemented, and on said date also executed an application for United States Letters Patent covering the ENIAC MACHINE developed and built as hereinbefore alleged. Said application was filed with the United States Patent Office on June 26, 1947, and is hereinafter called the "ENIAC PATENT APPLICATION". Since all applications for patent must be filed not more than one (1) year subsequent to a "public use" or an "on sale", as those terms have been defined by law pursuant to Section 102(b) of the Patent Act (35 U.S.C. Sec. 102(b)), the date of June 26, 1946 is herein called the "CRITICAL DATE", being one (1) year prior to the ENIAC PATENT APPLICATION filing date of June 26, 1947.

6. The applicants ECKERT & MAUCHLY, prior to the CRITICAL DATE, relinquished operational control of the completed ENIAC MACHINE, and permitted the alleged inventions embodied therein to be used, independently of their control or direction and without requirement of secrecy for their benefit, by numerous other persons for purposes other than experimentation by or on behalf of ECKERT & MAUCHLY. Such use by others constituted a "public use" of the alleged invention prior to the CRITICAL DATE within the meaning of the Patent Act (35 U.S.C. Sec. 102(b)). ECKERT & MAUCHLY, prior to the CRITICAL DATE, knowing the ENIAC MACHINE was past the experimental stage and had been reduced to practice, permitted the ENIAC MACHINE or the alleged inventions embodied therein to be sold

or offered for sale to the UNITED STATES and others. The alleged inventions were thus "on sale" prior to the CRITICAL DATE, within the meaning of the Patent Act (35 U.S.C. Sec. 102(b)).

7. During 1946, ECKERT & MAUCHLY created a partnership (hereinafter called "their partnership") known as Electronic Control Co. Thereafter, in or about October, 1946, ECKERT & MAUCHLY caused a Pennsylvania corporation to be organized known as ECKERT & MAUCHLY COMPUTER CORPORATION (hereinafter called "their corporation"). The claimed invention rights of ECKERT & MAUCHLY in the ENIAC MACHINE, and in the ENIAC PATENT APPLICATION, either were retained by ECKERT & MAUCHLY or purportedly became assets through assignment or otherwise of their partnership and/or their corporation.

8. On February 13, 1950, ECKERT & MAUCHLY executed, and later filed in the United States Patent Office, an Assignment of their claimed rights in and to the alleged inventions in the ENIAC PATENT APPLICATION and any or all patents issued or to be issued as a result thereof to their corporation. Thereafter, on November 4, 1955, their corporation assigned said claimed rights to REMINGTON RAND, INC. notwithstanding that a prior instrument dated July 5, 1955, filed in the United States Patent Office, had stated that corporation's name to be that of defendant. Defendant, in any event, thereafter continued and controlled the prosecution of said ENIAC PATENT APPLICATION.

9. On February 4, 1964, United States Letters Patent No. 3,120,606 was issued, based upon the ENIAC PATENT APPLICATION, and defendant was named the owner on the face thereof.

10. On or about March 21, 1964, defendant created a wholly-owned and controlled subsidiary corporation, under the laws of the State of Illinois, known and described as Illinois Scientific Development, Inc., and having its sole office in Chicago, Illinois (hereinafter referred to as "ISD"). Defendant assigned its claimed rights in the ENIAC PATENT to ISD. Upon information and belief, ISD was formed for the purpose, and in fact acts only in the capacity, of holding naked legal title to the ENIAC PATENT assigned to ISD by defendant as the only substantial asset of ISD. Upon information and belief, ISD is a mere corporate alter ego of defendant, and, in any event, is an agent of or in active concert or participation with defendant in connection with the matters complained of herein.

11. On June 9, 1964, defendant, acting through ISD, charged plaintiff with infringement of the ENIAC PATENT. This charge of infringement has since been reasserted by defendant in its own name and on its own behalf and continues to be so asserted directly by defendant.

12. At all material times before June 26, 1947, ECKERT & MAUCHLY, their partnership and their corporation, each and all had direct knowledge of the facts alleged in Paragraphs 4 through 6 hereof. Notwithstanding the foregoing, on June 26, 1947, ECKERT & MAUCHLY willfully and knowingly executed a written oath and filed the same in the United States Patent Office, in which ECKERT & MAUCHLY falsely and fraudulently swore that they did not know and did not believe that the alleged invention or inventions claimed in the ENIAC PATENT APPLICATION had been in public use or on sale prior to the CRITICAL DATE.

13. On information and belief, ECKERT & MAUCHLY did not themselves or either of them jointly or separately invent subject matter claimed as their inventions in the ENIAC PATENT APPLICATION or the ENIAC PATENT, but instead, derived such subject matter from others. Notwithstanding the foregoing, on June 26, 1947, ECKERT & MAUCHLY filed a written oath in the United States Patent Office in support of the ENIAC PATENT APPLICATION in which they falsely and fraudulently swore that they were the original, first and joint inventors of the alleged inventions claimed or disclosed in the ENIAC PATENT APPLICATION.

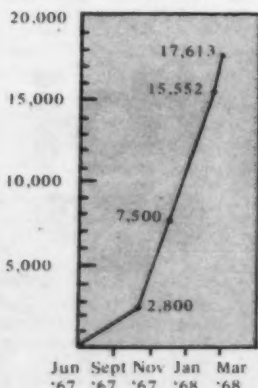
14. At material times prior to February 4, 1964, ECKERT & MAUCHLY and their successors in interest, including defendant, willfully and knowingly failed to disclose the facts hereinbefore alleged in Paragraphs 4 - 6 and 12 - 13 hereof to the United States Patent Office, and actively participated in preventing the disclosure thereof to said Patent Office and to others interested in or adversely affected by the ENIAC PATENT APPLICATION.

15. The issuance of the ENIAC PATENT was willfully, wrongfully and fraudulently delayed from the filing of the ENIAC PATENT APPLICATION on June 26, 1947, to the issuance of the ENIAC PATENT on February 4, 1964, by ECKERT & MAUCHLY and their successors in interest, including defendant, by, among other things, the suppression of information and lengthy administrative and judicial proceedings calculated to prolong and in fact unnecessarily prolonging the period of time during which the ENIAC PATENT APPLICATION remained pending. The deliberate delay in procuring the issuance of the ENIAC PATENT prevented the alleged inventions claimed or disclosed therein from promoting the progress of science and the useful arts. As a result, the limited statutory monopoly which the ENIAC PATENT purports to confer on defendant violates the provisions of Article I, Section 8 of the United States Constitution, and said ENIAC PATENT is, therefore, unconstitutional, void and was issued in excess of the jurisdiction of the United States Patent Office.

COMPUTERWORLD POPULATION REPORT

In only nine months (June 1, 1967 - March 1, 1968) COMPUTERWORLD has gone from zero to 17,613 paid subscriptions:

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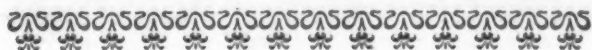
Wright Line Sells Honeywell Disks

WORCESTER, MASS. — Some \$3,500,000 worth of Honeywell model M4005 disk packs will be bought by Wright Line, a division of Barry Wright Corp. — and will be resold under the Wright Line label — starting next month.

When other disk pack models are developed and produced by Honey-

well, Wright Line will have the right to market them too, under a recently negotiated contract.

Up to 9,200,000 characters of information are stored by a model M4005 consisting of six 14-inch disks. It is the first consumable computer supply item from Honeywell's newly formed special products division.



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Univac Shows Style Of Future Card Units

PHILADELPHIA — A sophisticated replacement for the punch card is being developed by Univac.

The reusable wallet size plastic card has a high enough information density to carry 12 times the information of a standard punch card and still have space for pictorial information, a 180 character man-readable section, and an authentication signature.

Univac expects to be able to process the cards at the same speeds that punch cards are now processed, although the prototype system now being demonstrated can process cards at only 300 per minute.

Boon To Small User?

For the small user who finds punch cards inadequate and is looking to a small computer, the new system may provide the answer. But it is still experimental, and Univac has not announced a date for beginning production.

The system is also interesting because it is the first fluidic data processor.

The technique was proposed by the U.S. Army Electronics Command and developed by Univac. It is now in the exploratory stage at the Electronics Command, although Univac has begun to demonstrate a prototype system at its headquarters in Philadelphia.

Could Combine Many Functions

Utilizing the techniques demonstrated by the present machine, it would be possible to build a single machine combining the functions of a number of present day card tabulating machines, such as sorting, collating, and updating.

Univac believes that the new system could bring about a radical change in military and commercial tabulating practices in such operations as inventory control, personnel records, handling of scientific data, military logistics, and intelligence information.

All Fluidic

The new technique employs an all fluidic (air) transport system with almost no moving parts.

According to Dr. Joseph Mathias, director of research of Univac's Data Processing Division, "The new approach is inherently more reliable than any mechanical system previously tried. The reason is simple. Nothing in the transport path moves except air and the records themselves. There are no contacts to wear out, no belts to replace, no bearings to lubricate. Records can be handled over and over again without damage to them or the machine."

Fluidics is the use of a small, easily manipulated control stream, such as an air current, to control the action of a much larger stream of air.

2-1/2" X 4"

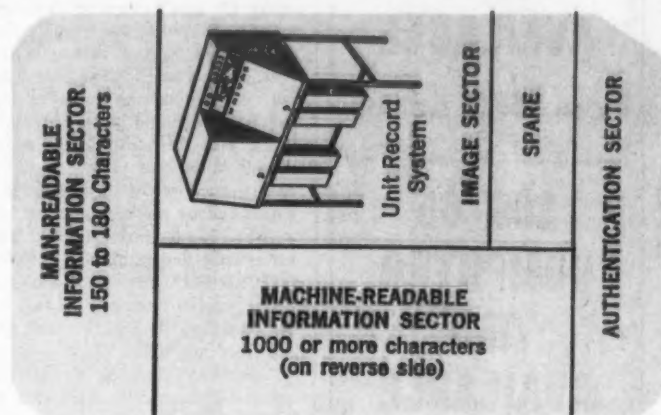
The card is made of polyester plastic measuring 2-1/2 inches by 4 inches overcoated on both sides with a thin nickel-cobalt magnetic film. In the present experimental card, the

Do You Need IBM Unit Record

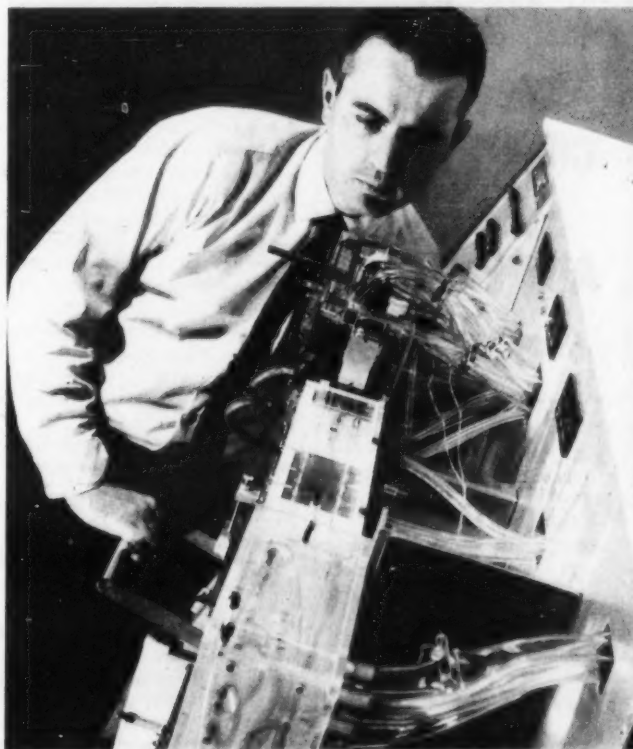
024, 026, 082, 083, 077, 085,
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Univac's experimental data card (exact size).



Univac technician checks the action of the feeder and transport in the new experimental Unit Record System developed by Univac. The picture on page 1 shows another view of the same unit. An engineer is checking the card stacker.

machine readable sector employs digital magnetic recording in a 1 inch by 2-1/2 inch area.

Store 1000 Characters

The plastic magnetic record can store 1000 characters — more than 12 times as much information as a standard punch card — using only 12.5% of its magnetic surface for machine readable data. If the full area on both sides of the record were devoted to machine readable information at the present packing density, 8000 characters could be recorded.

Univac claims that the card is more ruggedly constructed than a punch card, has considerably better resistance to heat and humidity, and can be erased and reused innumerable times.

Details Of Prototype

The present experimental fluid transport system consists basically of an input hopper, a read/write station, and two output stackers. In operation, cards enter the machine from metal cartridges that serve both as the input or feeder hopper and as the output receptacles or stackers. From the feeder cartridge the cards move into a

pre-separation and pickup zone controlled by a fluid powered system.

The cards are then injected into a pneumatic transport, which conducts them past a read/write station and then to a fluidically controlled gate which diverts the cards into one of the two output stackers. The movement and location of cards in the output stacker cartridges is regulated entirely by fluidic control.

300 Cards Per Minute

While the prototype system can process cards at the rate of 300 per minute, Univac expects an eventual speed of 1200 cards per minute.

Many of the techniques in the system are the outgrowth of Univac's research into fluid transports and also its pioneering work in fluidic technology that resulted in the development of the world's first all fluidic digital automatic computer in 1964, and the development of an extensive line of miniature fluidic components and circuits.

The experimental Unit Record System was developed under an exploratory development program by Univac under a contract from the U.S. Army Electronics Command at Fort Monmouth.

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Regional Breakdown

Managers, Operators, & \$\$\$

Salary for data processing managers, the top paid position in the data processing field, is itself highest in the West North Central states. For assistant data processing managers top pay is to be found in the Mountain states, with the South Central states as runners up.

These are two of the findings in a national salary survey conducted last year by International Data Corp. The survey was first published in COMPUTERWORLD last year. Because of many requests from new readers, we are reprinting it. The first half was published last week.

Another interesting fact is the contrast between the availability of jobs for DP managers vs Assistant DP managers. While the position of manager of data processing is distributed in rough proportion to the number of computer installation facilities in an area, the number of positions open for an assistant manager of data processing is more in proportion to the number of large computer installation facilities in an area.

For example, although the Middle Atlantic area has 3600 data processing manager positions and the Pacific states have only 2270, the Pacific states have more assistant manager of data processing positions than do the Middle Atlantic, by a 1500 to 1350 comparison. This, of course, indicates that the Pacific states have larger computer complexes per installation facility, on the average, than the Middle Atlantic states.

The job definitions of the six areas covered this week are:

SUPERVISOR OF COMPUTER OPERATIONS

Plans, organizes, and administers computer and peripheral equipment operations.

Direct responsibility: Scheduling the use of computer equipment for maximum efficiency; directing the training of operational personnel; preparation of assignment schedules for Operations Personnel.

COMPUTER OPERATOR

Monitors and controls a computer.

Direct responsibility: Correct and efficient computer operation; control

of computer console; recording of required operational data.

Deals with: Programming and Systems Analysis Personnel on specific program requirements.

Responsible to: Supervisor of Computer Operations.

TAB AND PERIPHERAL EQUIPMENT

Plans, organizes, and administers the peripheral and tabulating equipment used to support the computer installation.

Direct responsibility: Efficient

utilization and peripheral equipment and tab units; assignment of personnel; scheduling of work flow, direction of training of equipment operators; direction of personnel in his department.

Deals with: Installation technical personnel with regard to the execution of computer applications.

Responsible to: Supervisor of Computer Operations.

TAPE LIBRARIAN

Maintenance of a paper and/or magnetic tape library containing computer readable data.

Direct responsibility: Cataloguing content of reels of paper and magnetic tape, assignment of storage areas; preparation of reference files for reel location.

Deals with: Technical staff members; other library personnel.

Responsible to: Supervisor of Computer Operations and/or Tab and Peripheral Equipment Supervisor.

MANAGER OF DATA PROCESSING

Plans, organizes, and administers overall activities, including systems analysis, programming, and computer operations.

Direct responsibility: Implementation of programs of top management; major personnel problems; administrative and organizational concerns.

Deals with: Manager of departments within the computer installation, directors of departments using or planning to use computer facilities.

Responsible to: High level middle management and/or top management for data processing plans, performance, and objectives.

ASSISTANT MANAGERS OF DATA PROCESSING

Assists manager in his functions.

Direct responsibility: May act for manager in his absence; directs studies of existing or planned systems and procedures; evaluates new equipment and techniques.

Deals with: Installation staff members and assistant managers of other departments with regard to computer installation systems, procedures, and capabilities.

Responsible to: Manager of Data Processing.

TABLE I
Average Weekly Salaries

Geographic Area	Supervisor Computer Operations	Computer Operator	Tab & Peripheral Equipment Supervisor	Tape Librarian	Manager of Data Processing	Asst. Mgr. of Data Processing
New England	\$171	\$106	\$137	\$102	\$286	\$235
Middle Atlantic	178	112	167	102	268	220
South Atlantic	157	108	152	97	255	209
E. North Central	181	112	164	102	276	227
W. North Central	173	108	158	98	297	235
E. South Central	161	98	141	95	292	242
W. South Central	173	115	154	98	290	240
Mountain States	178	114	159	97	289	263
Pacific States	187	119	171	106	278	247
National Average	\$175	\$112	\$160	\$104	\$277	\$227

TABLE II
Estimated Total Number of People Employed

Geographic Area	Supervisor Computer Operations	Computer Operator	Tab & Peripheral Equipment Supervisor	Tape Librarian	Manager of Data Processing	Asst. Mgr. of Data Processing
New England	1200	4900	800	900	1300	700
Middle Atlantic	3400	15000	2100	2300	3600	1350
South Atlantic	2000	8100	1500	1100	2080	850
E. North Central	3600	15000	2800	2200	3860	2000
W. North Central	1200	5100	800	750	1320	600
E. South Central	600	2450	400	380	640	200
W. South Central	1200	5100	800	870	1340	320
Mountain States	550	2400	400	400	600	105
Pacific States	2100	9800	1300	2000	2270	1550
National Total	15,850	57,850	10,900	10,890	17,010	7,675

30-Minute Cobol Test

The U.S. Navy Cobol test routines have been designed to determine the validity of Cobol compilers with USASI standards. There are a number of different levels of compilers that can function in the proposed standard.

The routines have been grouped so that any combination of levels and modules can be tested. This means that if only the basic compiler is to be used, it is not necessary to hand pull the more sophisticated elements of language used in higher levels. It is simply not necessary to run all of the 15 groups of programs.

Language Tested First

In operation two or three compilations can be expected. First, the operator will change a few standard cards - routine environment data, name of the computer, etc. Then, the first compilation is attempted. If the compiler being tested does indeed contain all language elements it will run straight through and come to an ordinary halt with an object program available.

Normally, however, this will not happen. Some item will not be present and the compiler will reject certain statements - perhaps indexing will need table handling, etc. This tests what language is involved, and whether or not the full standard language is available.

No Special Routine Knowledge Needed

After this first compilation, it may be necessary to pull a few more cards or make them into "comments"

which do not effect the program. Still, there may be specific types of data referred to that are not available in the compiler. This may take another one or two compilations to check out. No special knowledge of the routines is necessary.

After this computation and a clear compilation run have been obtained the programs are executed, and the results compared with what they should have been. This tests not only the availability of the language but also that it works properly. It shows, for instance, that two multiplied by three really equals six. The tests are not extensive but they do test all elements. The output is quite simple, listing each item in the manual and a statement as to whether or not it passed. If it failed the right answer is given.

Reduction In Special Input

In order to simplify the testing, the data is actually contained in the programs, avoiding, as far as possible, the need for special input. In fact, the only special input used consists of a few cards in the sort routine. They are enclosed in an ordinary 4 x 10 envelope.

The importance of the test appears to be that it is uniform, and can be applied quickly to any compiler. The available figures indicate that it will take about 25 minutes. However, this seems to be something of an understatement as there are very few, if any, compilers that completely conform to the proposed USASI Cobol standards.

New Products

5-Min Updating For Microfilm Aperture Cards Is Delivered



The operator's control console of Link's microfilm updating system consists of a primary electronic display with the control panel and light pen positioned directly in front of the operator; a secondary optical display with aperture card printer at the operator's right; and an electric input typewriter positioned at the operator's left.

A microfilm updating system that makes it possible to revise an aperture card in "as short a time as five minutes" has been delivered to U.S. Army Weapons Command, Rock Island, Ill., by the advanced products division of Link Group, General Precision Systems Inc. Using this first Automated Microfilm Aperture Card Updating System (Amacus), usual procedures involved in updating microfilmed material, such as making revisions on paper and refilming paper, are eliminated. The system has the unique capability of revising microfilmed documents electronically. General Precision Systems, Inc., 1077 E. Arques Ave., Sunnyvale, Calif. 94086.

A new electronic device designed to improve the speed and accuracy of reporting stock market transactions is in operation on the floor of the New York Stock Exchange. Resembling a small television screen over an adding machine, the device relays details of thousands of buy and sell executions daily from the Exchange floor to the main office of Goodbody & Co. It relays information faster than any other reporting device previously available for the same purpose, according to Bunker-Ramo Corp., 445 Fairfield Ave., Stamford, Conn. 06904.

The Micro-Folio process of creating microfiche masters has been adapted to incorporate application of columnar data, vertically, to an optically clear acetate sheet. This is significant in computer printout data — both 16 mm film and paper — according to Atlantic Microfilm Corp. Paper printout columns can be microfilmed with a rotary copying camera under the new method, and the film is applied to the acetate sheet with a special adhesive that is sensitive to pressure. Computer film output can be applied directly to the sheet. Atlantic Microfilm Corp., Spring Valley, N.Y.

More details have been released concerning the SCC 2700, an 880 nanosecond digital computer recently developed by Scientific Control Corp. Basic memory module is a 2-1/2 D 4096 core memory with 880 nsec full cycle time. Memory is completely asynchronous to the CPU, and the memory capacity is claimed to be expandable to 65,536 words in 4096

word increments. Memory parity can be added as an optional feature.

SCC claims that the 2700 presents the user with a cost performance ratio that "cannot be matched" by any other machine of its class, and that the 2700 offers a degree of maintainability "not previously realized." Scientific Control Corp., 14008 Distribution Way, Dallas, Texas 75234.

Mark IV Gets Support Mgr.

SHERMAN OAKS, CALIF. — Informatics' Mark IV organization has set a precedent by appointing the first manager of a software field support staff. He is Robert R. White, who will direct the Mark IV system engineering staff and regional educational centers. He will coordinate field activities and train future staff members.

Various functions of computer programming are automated by the Mark IV file management system, through the specification checking (SpecCheck) technique. A proprietary product for use with IBM 360 equipment, Mark IV operates under DOS or OS environment.

Field offices are now operating in New York, Washington, Los Angeles, and Chicago. The Mark IV system is reportedly scheduled for delivery to more than 100 installations around the world.

Computer Stocks: Trading Summary

Week Ending March 15, 1968

NEW YORK STOCK EXCHANGE

	1967	1967	1967	1967	1967	1967	1967
	High	Low	High	Low	Last	Week Net Change	Week % Change
Addressograph-Multigraph	80 1/2	46 7/8	58 3/8	55 1/8	56 1/8	-1 3/8	-2.39
American Research	195	37 3/4	144 1/2	130	142	+8 1/2	+6.37
Amper Corp.	40 3/4	22 3/4	30	27 3/8	28 1/4	+1 1/8	+4.15
Burroughs	198 5/8	80 7/8	177 7/8	165 1/4	173	+4 1/2	+2.43
Collins Radio	114 7/8	53	73 1/2	67 1/4	72 1/2	+4 1/2	+6.62
Control Data	165 5/8	33 1/2	115	104	112	+4 3/4	+4.43
Electronic Associates	30 1/4	16 3/4	22	19 3/4	21	+7/8	+4.35
General Electric	115 7/8	82 1/2	89 1/2	86 1/2	88 3/8	+1 3/4	+2.02
Honeywell	117 7/8	63 1/2	102	93 5/8	101 7/8	+8 3/4	+7.40
IBM	648	362 1/2	397	373	589 1/8	+9 5/8	+1.66
Litton	120 3/8	62 1/2	67 3/4	63 1/8	64 1/2	-1 5/8	-2.46
Nat Cash Register	136 5/8	67 1/8	109 1/2	103	108	+6 1/4	+6.14
RCA	65 1/2	42 5/8	48 3/8	45 3/8	46 3/8	+1/8	+0.27
Raytheon	117	69	84 3/8	78	79 5/8	+5/8	+0.79
Sanders	77 1/4	37 5/8	48 7/8	42 3/4	44 7/8	+3/8	+0.84
Scientific Data	152 3/4	70 3/8	130	120	126	+6 1/2	+5.44
SCI	82 1/4	39 1/2	43 1/2	40 3/8	41 7/8	+7/8	+2.13
Sperry Rand	65 1/8	28 1/8	48 1/8	42 3/4	46 1/8	+3/4	+1.65

NYSE COMPUTER STOCK AVERAGE

+3.16 +2.96

AMERICAN STOCK EXCHANGE

	1967	1967	1967	1967	1967	1967	1967
	High	Low	High	Low	Last	Week Net Change	Week % Change
Audio Devices, Inc.	68 1/2	41 1/2	49	45 3/8	48 1/8	+2 7/8	+6.32
Bunker-Ramo	21 7/8	7 1/2	13 3/4	12 1/2	13	-5/8	-4.59
Calcomp	46 3/4	28 3/4	32 7/8	29 1/2	32	+2 1/8	+7.11
Computer Application	47 3/8	14	24 7/8	22 1/8	22 3/4	-3/4	-3.19
Computer Sciences	67 5/8	18	17 7/8	14 1/8	16	+1/2	+1.41
Digital Equipment Corp.	156	29 3/8	114	100	107 1/2	+5 3/4	+5.65
GC Computer Corp.	41	23 1/4	30 3/8	28	28 5/8	-1/2	-1.72
Leasco	146 1/4	33 5/8	103	93 1/2	97	+3 7/8	+4.16
Levin-Townsend Computer Corp.	77	10 7/8	51 7/8	45 1/2	49 1/2	+3 3/4	+7.01
Milgo Electronics	23 1/8	5 1/8	16 5/8	13	16 1/4	+1/8	+0.78
Mohawk Data Sciences	198 1/2	108	144	127	137 3/4	+13 3/4	+11.08
Planning Research	51	27 5/8	34 3/8	31 5/8	32 7/8	+1 5/8	+5.20
Potter Instrument	40 1/2	12 3/8	24 3/8	20 1/2	23 1/2	-1 1/8	-4.57
Randolph Computer Corp.	55 3/4	32 1/4	40 3/4	36 1/2	38	+3/8	+1.00

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OVER THE COUNTER

	1967	1967	1967	1967	1967	1967	1967
	High	Low	High	Low	Last	Week Net Change	Week % Change
Applied Data Research	17 1/2	15 1/2	17 1/2	18 1/2	17	+1/2	+2.94
Arias	30 1/2	12 3/4	20	21 1/2	17	+3	+17.65
Bolt, Beranek & Newman, Inc.	30	8 1/4	17 1/2	18 1/2	16 3/4	-3/4	-4.48
Computer Usage	72	20 1/4	40 1/2	42	39 1/2	+1	+2.53
Cyber-Tronics	19	4 3/4	11 3/4	12 1/2	12	-1/4	-2.08
Data Products	23 3/4	2 1/2	14 5/8	15	14 3/8	+1/4	+1.74
Digitronics	27 1/2	6	17 1/2	18 1/2	19	-1 1/2	-7.90
DPA, Inc.	17 3/8	4 1/4	12 1/2	13	12 3/4	-1/4	-1.96
Electronics Memories	57 1/8	6	36	37 1/2	36
Fabritek	15 1/4	6	8 3/8	9 7/8	9 5/8	-1/4	-2.59
Informatics	59 1/2	7 1/2	32	34	34	-2	-5.88
INM Data Inc.	16	7 1/8	9 1/4	9 3/4	10	-3/4	-7.50
Management Assistance	24 3/8	10 1/8	10 3/8	10 3/4	11 1/4	-7/8	-7.78
Memorex	67 1/4	52	34 1/2	56	56	-1 1/2	-2.68
Optical Scanning Corp.	102	25 3/4	83	87	77	+6	+7.79
Programming & Systems, Inc.	14 3/4	11 3/4	14 1/2	15 1/2	13 3/4	+3/4	+5.45
Recognition Equipment Corp.	45 1/2	38 1/2	42	43	41	+1	+2.44
Systems Engineering Labs	24 1/2	22 1/4	22 1/4	23 1/4	22 1/4
University Computing Co.	95	57	63	65	57	+8	+10.53

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Case Histories From Hospitals

12 Terminal System Hopes To Cut Out 50% Of Visits

BOSTON - A local hospital is using a time shared system for scheduling outpatient visits that could halve the number of visits for some patients, and will cut waiting time for most.

Children's Hospital Medical Center has installed a Honeywell 1200 to handle scheduling for its 54 outpatient clinics. Another H-1200 will be installed later this year to replace an IBM 360/30 already installed. Details on the replacement will appear next week in **COMPUTERWORLD**.

12 Terminals For On-Line Functions

Children's staff will be able to use their 12 terminals to handle any of nine on-line functions that are being programmed (admit, update, make an appointment, cancel an appointment, cancel a clinic session, inquiry, medical record request, attendance, and schedule change).

The system consists of a central processor with a memory capacity of 65,536 characters, 12 cathode ray tube (CRT) terminals with input keyboards, three teletypes, one high speed 650 line per minute printer, four magnetic tape drives, three on-line disk pack drives, and a card punch.

The CRT units are in the reception areas and administrative offices in the 11 story Fegan Building. One of the teletypes will be in the medical records library, the other two (in parallel) in the main reception area.

Index records will be kept on disk packs. Children's expects to get 30,000 records per pack.

500 Patients Per Day

Previously, all scheduling was done manually. Children's has over 40,000 patients who make over 150,000 visits to the 54 outpatient clinics each year. That is over 500 visits a day.

Because of the scheduling difficulties, the outpatient clinics have operated on a first come, first served basis, with patients seeing whatever doctor happened to be free when their turn came up. In addition, a child needing to be seen in more than one clinic because of a combination of ailments usually had to make a return visit.

The best that Children's could do without the computer was block scheduling. Many patients were told to come at 8 am, another group at 10 am, etc. Patients lost time because of this, and children became irritable and more difficult to manage when finally seen by the doctor.

With the computer, individual appointments will be made every 20 minutes or half hour, depending on the clinic and child's medical problem. Clinic personnel can quickly determine what appointment times are available, and can offer the patient or parent a choice. Through computer scheduling, appointments can be made for two clinics for the same morning or afternoon.

Same Doctor Each Visit

Eventually, Children's plans to write programs that will allow clerks to schedule patient appointments with specific doctors. Presently, even with the computer, a patient may be handled by a different doctor at each visit. "We want to give each child visiting any of our clinics the same sort of individual care and direction he would receive from his private pediatrician," said Dr. Leonard W. Cronkite, Jr., general director at Children's. He believes that the computer "will help us reverse the trend of providing care in a cold, impersonal manner."

Maintain Active Patient File

A principal function of the computer as a scheduling tool is in maintaining an index file on patients who are actively using the clinic. This is a 200 character locator file containing the patient's medical record number, name, birth date, sex, religion, financial category, and appointment record.

Additional data on patients, primarily for accounting and billing, will be kept off-line on magnetic tape.

Entering A Patient Record

A child's name gets into the computer in any of several ways. If a child is referred to the clinic by a doctor, the basic information would be sent to the clinic from the doctor's office on a form. A clerk then uses the keyboard of the



A toy dog and paper flower decorate the CRT unit which starts a mother and child through the outpatient clinic at The Children's Hospital Medical Center.

CRT unit to create the index record. This is done with several of the on-line functions previously listed.

To begin an index record, the clerk presses a button marked "admit" and then types in all the data on the patient. This appears on the CRT and she types it. Next she presses the "transmit" button and the computer accepts the data.

When the child and parent appear on clinic day, the clerk presses the "inquiry" button and the proper record number. The child's file is displayed on the CRT with blanks for information to be filled in. The clerk uses the "update" function to fill in the blanks.

CRT Units Limited

The functions of the various CRT units are limited. An index record can be created only at the main reception desk. A change in medical records can be made only in the medical records library.

So far, Children's has written 38 batch programs for such things as reports and file maintenance, as well as several subprograms for the nine command functions. All are in the Easycode assembly language.

After the clinic day, the computer does several housekeeping jobs using the high speed printer and magnetic tapes. It makes an alphabetical master log listing all patients who have appointments the next day. This is used by the main reception desk. It also makes a printout especially for each of the 54 clinics. This list also contains any specific instructions for the doctor or nurse. Finally, a list is prepared showing appointments two days in advance. This is used by the medical records library for pulling records.

Public Health Service Grant

The scheduling system is being developed, and the Honeywell 1200 installed, with a \$668,621 grant from the U.S. Public Health Service. The grant covers a three year period. Children's plans several experiments during that time.

'Scope' Identifies Patients' Needs; 'Shas' Sends Bills

Other hospitals beside Children's Hospital Medical Center in Boston are getting help from computers. At least two other projects are now underway.

Scope (Staffing Care for Patients Effectively) has adapted aerospace management techniques to staffing needs of California hospitals. Shas (Shared Hospital Accounting System) has provided a centralized computer service to handle administrative and patient needs of hospitals in central Ohio.

SCOPE

Scope is an objective method of making the most effective use of hospital staff and facilities, according to Aerojet General, developer of the new technique. Scope was formulated after studies under contract from the California department of mental hygiene. Data on the activities of 13 state hospitals was collected over a nine month period, and fed into an IBM 360. The result was a revised set of staffing standards.

SHAS

Shas will help to offset rising costs of administering hospital care, according to its sponsor, Blue Cross of Central Ohio. Shas was announced following a six month study in which business office methods of nine hospitals were reviewed and evaluated to determine the potential value of a shared hospital computer facility. The study was done by an independent consulting firm. Several hospitals have already signed up for the plan.

Just the Beginning

The Scope study in California identified needs of individual patients. Nursing time needed by each patient was calculated for each ward and for the hospital as a whole. By making periodic surveys, staffing assignments could be adjusted, allowing the hospital to place its nursing personnel where they were most needed.

Under the Shas program, services available to central Ohio hospitals include record keeping, patient billing and electronic filing of patient hospital records. The Shas network provides a sophisticated and comprehensive approach to data processing, according to Howard C. Franz, president of Blue Cross of Central Ohio. "It represents one of the most important forward moves in hospital administration in a decade, though it is just the beginning," Franz said.

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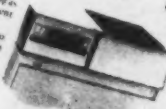
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*To investigate this news story **COMPUTERWORLD** checked on the facts behind it. Our representatives visited MAI's offices in New York City - inspected the all-important timing curves at the engineering plants in California - for both the new system and for the standard IBM 2311.

COMPUTERWORLD FINDS 10 FACTS FOR YOU

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NEW YORK - Disk based MAI users want to add to improve their programs without programming a result of a marketing agreement between MAI and MAI.



MAI's Peripheral Systems Division, which makes the 630, MAI's 630 with 10 discs, 32 of the IBM 2311 Model 1 which it can replace.

Another advantage, he cited was that the system was an electronic memory of the 630's 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000.